

Highly educated, highly Mobile? Location choices of doctorate recipients working inside and outside academia.

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This paper contributes to a better understanding of the location decisions of highest qualified individuals working inside and outside academia.

Doctorate recipients are heterogeneous in their preference for an academic career and not all doctoral students pursue the goal of a long-term academic career (Roach & Sauermann, 2017). For many doctoral graduates, the period after graduation in particular represents an important transformational phase (König et al., 2019; König, 2022). Shortly after graduation, the course is set for doctorate recipient's future career. The period after graduation is often associated with a change from a position at a university or PRO to employment in the private sector. In many developed countries, such as the USA (Bud & Reader, 1989) and Germany (Murmans, 2013) a long tradition of employing scientists in private research laboratories, as well as in leading management positions does exist. The entry of university graduates into the labour market serves as a relevant channel for the transfer of knowledge from public research to the private sector (Aschhoff et al., 2013; Cohen, Nelson, & Walsh, 2002). During their doctoral studies, doctorate recipients acquire general problem-solving skills and abilities that are also transferable to other sectors of the economy (Sinche et al., 2017). Hiring doctorate recipients gives companies access to the latest research and knowledge, which also translates into private sector innovation (Buenstorf & Heinisch, 2020; Buenstorf, Heinisch, & Kapa, 2022; Zellner, 2003).

We investigate the geographical patterns of labour market entry (at the level of German functional labour market regions (planning regions) for doctoral graduates starting their first position after receiving their doctorate. The mobility decisions of more than 23 thousand doctoral graduates in Germany from five graduation cohorts are examined using a unique micro level data set based on doctorate recipient's social security records. Data from the IAB-INCHER Project of Earned Doctorates [IIPED] (Heinisch, Koenig, & Otto, 2020) combines data from the catalogue of the German National Library [*Deutsche Nationalbibliothek*, DNB] with the Integrated Employment Biographies [*Integrierte Erwerbsbiographien*, IEB] of the Institute for Employment Research. It enables a longitudinal view of the working histories and migration decisions of doctorate recipients in Germany across different cohorts and sectors.

Referring to the importance of doctorate recipients as a highly qualified workforce for the private sector as well as their contribution to regional knowledge stock, this study focuses on differences in the mobility patterns of doctoral graduates remaining in academia or moving to the private sector. We investigate factors influencing the mobility of highly qualified individuals depending on the work context.

We estimate conditional logit models (Davies, Greenwood, & Li, 2001) explaining first choice of doctorate recipients working region after graduation. Influencing factors on mobility of these highest educated individuals are selected based on the literature of mobility of university graduates and high-qualified workers as well as theoretical economic considerations. Explaining factors contain hard

economic variables as well as indicators for social ties and the fit of the regional labour market in relation to subject-specific characteristics. From a methodological point of view, this paper investigates social ties by the university and subject specific number of previous doctorate recipients moving/staying in a region. Moreover, we investigate the relationship between different disciplines and regional labour market opportunities for doctoral recipients. We introduce a localisation quotient, which depicts the degree of regional specialization into those economic activities being related to different subjects. This quotient indicates the potential match between subject-specific knowledge and skills and regional labour prospects (Neffke, Otto, & Weyh, 2017).

Empirical findings suggest that factors influencing the choice of a working region after graduation differ depending on whether doctoral graduates remain in academia after graduation or switch to the private sector. The results indicate that especially researchers who remain in academia, tend to move to regions where they have stronger networks. For doctoral graduates who leave academia after graduation, on the other hand, a good fit between subject-specific qualifications and the structure of regional labor market seems to be relevant. At the same time, there are a number of regional factors that favour the choice of a region for both groups, such as low unemployment rate and regional amenities. Further, there is a high attachment to the graduation region. This result is particularly relevant for regional science, as it shows that doctoral graduates as group of most highly educated workers are less mobile than often expected. This means that doctoral training in a region contributes substantially to leverage regional human capital resources. This might be particularly an important issue for smaller and economically lagging regions, which normally have problems in keeping and attracting young, highly skilled workers.

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